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SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
WASHINGTON, DC 20037-3213

EXAMINER	
MOE, AUNG SOE	
ART UNIT	**PAPER NUMBER**
2612	

DATE MAILED: 02/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/715,164	TOUMA ET AL.	
	Examiner	Art Unit	
	Aung S. Moe	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *24 June 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☒ Claim(s) *12-15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on 6/24/2004 have been fully considered but they are not persuasive.

Regarding claims 1, 3, 4 and 6, the Applicant alleges that Pham '960 does not discloses or even remotely suggest that "the luminance be changed for the light emitting elements during the time the light emitting elements are on (lighting time)" as set forth in the claimed combination. In fact, Pham '960 discloses that the current level to each LED is the same and the pulse duration is varied (col. 4, lines 41-43), thus, the luminance level of the LEDs in Pham '960 is constant during the one-cycle."

In response, the Examiner respectfully disagrees because in col. 5, lines 20+/45+, that the light output of the LED is balanced by use of selective adjustment of Rref associated with the LED, thus, it is noted that the luminance (i.e., brightness) level of the LEDs in Pham '960 is not necessarily constant because the resistance values (i.e., the elements 78 of Fig. 2) of each LED can be adjusted. In particular, Pham '960 clearly shown in Figs. 6-9 that the luminance (i.e., brightness) of the respective light emitting elements (LEDs) is simultaneously changed by enabling the very **brightest LEDs** (i.e., noted the letter "B" as shown in Figs. 6-9) at the same time for a time period (i.e., the period "Z" as shown in Fig. 3) to record the gray level 1 dot and enabling the very **weakest LEDs** (W) at the same time for a time period (i.e., the period "X" as shown in Fig. 3) to record the gray level 15 dot (i.e. see col. 5, lines 55+, col. 8, lines 15-45. Moreover, the simultaneous changes of the brightness (i.e., "luminance" as claimed) of the respective LEDs (i.e., note "B" and "W" as shown in Figs. 6-9) is performed in accordance with

a predetermined characteristic curves (i.e., noted the predetermined characteristic curves as shown in Figs. 4-9; see col. 4, lines 55-60) as the lighting time (i.e., the exposure time) for each pixel elapses (i.e., see Figs. col. 8, lines 5-45).

In addition, the Applicant further alleged that Pham '960 does not discloses changing the luminance at a constant rate as set forth in claim 3 or non-linearly as set forth in claim 4.

In response, the Examiner respectfully disagrees because as discussed above Pham '960 does in fact discloses changing the luminance of the LEDs (i.e., noted the changes of brightness of the LEDs by the use of the brightest LEDs "B" and the weakest LEDs "W" as shown in Figs. 6-7) during the exposure time (i.e., noted the "EXPOSURE TIME" as shown in Figs. 6-9). Moreover, Pham '960 further discloses the use of "a constant rate" for changing of brightness (luminance) of the LEDs (i.e., noted the constant rate of the clock pulses are to be created in groups of uniformly spaced pulses. For example, the weakest LEDs "W" are used with the constant clock pulse 60-63 as shown in FIG 2 to change the luminance of the LEDs).

In addition, it is clear from Fig. 9 of Pham '960 that the luminance (brightness) of the LEDs is changed by energizing the brightest of the LEDs (B) and the weakest LEDs (W) for recording a gray level Nos. 1 dot thru 15 dot according to a non-linear curve (i.e., see col. 8, lines 19+).

In view of the above reasons, the Examiner asserts that Pham'960 anticipates the claims 1, 3, 4, 6 and 10; and claims 2, 5, 7-9 and 11 are obvious over the cited references for at least the reasons discussed above, thus, the Examiner will maintain the rejection as follows:

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 1, 3, 4, 6 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Pham et al. (U.S. 5,300,960).

Regarding claim 1, Pham '960 discloses a drive method for an optical printer (Figs. 1 and 2) that drives a plurality of light emitting elements to emit light in accordance with image data (i.e., noted that the LED array 20 drive in accordance with the image data; see col. 1, lines 20+ and col. 3, lines 1+), for recording pixels of different densities on a photosensitive recording medium (12) to form a grayscale image (i.e., col. 1, lines 55+, col. 2, lines 10+ and col. 4, lines 25+), the method comprising the steps of:

controlling time lengths of lighting the individual light emitting elements in accordance with tonal levels (i.e., the gray levels) of pixels to print that are represented by the image data (i.e., noted from Fig. 3-9 that the control unit 31 is capable of controlling time lengths of the LED array in accordance with the gray levels of pixels to print that are represented by the image data; col. 4, lines 30+, col. 5, lines 1+ and col. 6, lines 5+); and

simultaneously changing luminance of the respective light emitting elements (i.e., the LED array 20) according a predetermined characteristic curve (i.e., noted the use of curves as shown in Figs. 4-9) as the lighting time for each pixel elapses (i.e., as shown in Figs. 3-9 and further discussed in col. 2, lines 14+ and col. 9, lines 10+ that the control unit 31 is capable of

simultaneously changing the luminance of the respective LED elements with a respective predetermined count provide during the exposure time for each pixel elapses).

Regarding claim 3, Pham '960 discloses wherein the luminance of the light emitting elements (i.e., the LEDs) is changed with time at a constant rate (i.e., noted from Figs. 4, 6, 7, and 9, the exposure time generated by the luminance of the LED elements are changed with time at a constant rate; see col. 7, line 25-col. 8, lines 20+) from a constant initial value for each pixel (i.e., noted the initial value is provide by the counter 30 for each pixel; see col. 8, lines 15-50), whereas a lighting time length (i.e., the exposure time length, such that pulse X, Y and Z, as shown in Fig. 3) for each tonal level (i.e., the gray level 1-15) is determined by the initial value (i.e., the initial count value provided by the counter 30) and changing rate of the luminance of the light emitting elements (i.e., noted the rate of pulse changes as shown in Fig. 3) and coloring characteristics of the photosensitive recording medium (i.e., noted the color printing as discussed in col. 9, lines 60+).

Regarding claim 4, Pham '960 discloses wherein the lighting time lengths of the individual light emitting elements are changed proportionally to the tonal levels of the pixels to print (i.e., noted from Fig. 8 that the gray levels is proportional to the lighting time lengths of the exposure time; see col. 6, lines 40+), whereas the luminance of the light emitting elements are changed with time for recording each pixel according to a non-linear curve that is determined by the lighting time lengths for the individual tonal levels (i.e., noted from Figs. 4-7 and 9 that the luminance of the LED elements are changed with the exposure time for recording each pixel based on the non-linear curve that is determined by the lighting time lengths for the individual tonal levels; see col. 5, lines 55+, col. 7, lines 6+) and coloring characteristics of the

photosensitive recording medium (i.e., noted the coloring characteristics as discussed in col. 9, lines 60+).

Regarding claim 6, Pham '960 discloses wherein the light emitting elements (i.e., the LED array 20) are driven a number N of times of a constant unit time (i.e., noted that the clock 19 provides a constant unit time; see col. 6, lines 49+ and Fig. 8) for recording each pixel, the number N being '0' or an positive integer and varied depending upon the tonal level of the pixel to print (i.e., noted that the exposure times for gray level No. 1 is assigned a value "0" through "6"; see col. 6, lines 40+), to control the lighting time lengths (i.e., noted the control steps for controlling the exposure time lengths as shown in Figs. 4-9).

Regarding claim 10, Pham '960 discloses (in Fig. 9) wherein the luminance (brightness) of the light emitting elements (LEDs) is varied (i.e., noted from Fig. 9, that the brightness level of the LEDs is varied by using the brightest of the LEDs "B" for recording a gray level No. 1 dot and using the weakest of the LEDs "W" for recording a gray level No. 15) during an exposure time (i.e., noted the "EXPOSURE TIME" of 6-100 microsecond) for recording the pixels (i.e., see col. 8, lines 10-45).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pham '960 in view of Masubuchi et al. (U.S. 6,262,757).

Regarding claim 2, Pham '960 discloses the luminance of the respective light emitting elements (i.e., noted the LED elements as shown in Figs. 1 and 2) is raised as the lighting time (i.e., the exposure time) for each pixel elapses (i.e., see Figs. 3-9; col. 7, lines 50+, col. 8, lines 5+ and col. 9, lines 30+).

Further, it is noted that although Pham '960 shows the use of the photosensitive recording medium (12), Pham '960 does not explicitly state that the recording medium (12) is a self-developing type photo film unit as claimed.

However, the above-mentioned claimed limitations are well-known in the art as evidenced by Masubuchi '757. In particular, Masubuchi '757 teaches that it is conventionally well-known to use a self-developing type photo film unit (i.e., col. 1, lines 25+) which producing photographs shortly after the photosensitive medium has been exposed so that the delay between image acquisition and viewing the print is reasonably shot.

In view of the above, having the system of Pham '960 and then given the well-established teaching of Masubuchi '757, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Pham '960 as taught by Masubuchi '757, and such a modification would obviously allow for immediate preview of an acquired image thereof.

Regarding claim 5, Pham '960 discloses a printing head (i.e., Fig. 1, the element 10) that has the plurality of light emitting elements (i.e., the LED array of Fig. 1) aligned along a main scan direction (i.e., noted the LED array scan the recording medium 12 in the main scanning direction, e.g., across the medium 12, as shown in Fig. 1), and the photosensitive recording material (12) relative to each other in a such scan direction (i.e., the direction shown by the arrow in Fig. 1) perpendicular to the main scan direction, for recording the image line by line (i.e., col. 3, lines 5-10 of Pham '960).

Moreover, it is noted that Pham '960 does not explicitly show the step of driving the printing head in a sub scan direction.

However, the above-mentioned claimed limitations are well-known in the art as evidenced by Masubuchi '757. In particular, Masubuchi '757 teaches that it is conventionally well-known to use the driving means (Fig. 2, the element's 300) for driving the printing head (100) in a sub scan direction (i.e., Fig. 2, the direction B1) perpendicular to the main scan direction (i.e., the direction B2 as shown in Fig. 2), thereby affording images that are free from distortion (i.e., see col. 2, lines 3+).

In view of the above, having the system of Pham '960 and then given the well-established teaching of Masubuchi '757, it would have been obvious to one having ordinary skill in the art at

the time the invention was made to modify the system of Pham '960 as taught by Masubuchi '757, since Masubuchi '757 states at col. 2, lines 2+ that such a modification would reduce the image distortion caused by deviation in the speed of relative motion of the recoding medium and the exposure light element.

6. Claims 7-8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pham '960 in view of Nakatani (U.S. 6,373,514).

Regarding claim 7, Pham '960 discloses an optical printer (Figs. 1 and 2) for printing a grayscale image on a photosensitive recording medium (12) based on image data (i.e., col. 3, lines 3+), the optical printer comprising:

a printing head (i.e., Figs. 1 and 2, the element's 10) having a plurality of light emitting elements (i.e., the LED array) arranged in a main scan direction(i.e., the elements 10 and 20 of the LED array arranged in the main scan direction as shown in Fig. 1), for projections light beams towards the photosensitive recording medium (12);

a driving device for driving the light emitting elements (i.e., noted that the LED array are droved by the driver 23 as shown in Fig. 2; see col. 4, lines 15+) while controlling time lengths (i.e., noted the controlling time lengths as shown in Fig. 3) of driving the individual light emitting elements per each pixel in accordance with tonal levels of pixels to print that are represented by the image data (i.e., see figs. 3-9; col. 4, lines 25+, col. 5, lines 1+ and col. 8, lines 5+);

a control device (i.e., the control unit 31 as shown in Fig. 2) for changing luminance of the light emitting elements (20) according a predetermined characteristics curve (i.e., noted the predetermined characteristics curve as shown in Figs. 4-7 and 9) as the driving time for each pixel elapses (i.e., col. 7, lines 10+ and col. 8, lines 5+).

Furthermore, it is noted that although Pham '960 discloses wherein the printing head is capable of scanning the photosensitive recording medium (12) in the main direction for recording each line of image on the photosensitive recording medium, Pham '960 does not explicitly show a device for *shifting the printing head (10) relative to the photosensitive recording medium (12) in a sub scan direction* perpendicular to the main scan direction after each line of the image is recorded on the photosensitive recording medium (12).

However, the above-mentioned claimed limitations are well known in the art as evidenced by Nakatani '514. In particular, Nakatani '514 teaches that it is conventionally well known in the art to use a scanning device (Figs. 1 and 3) for *shifting the printing head (60) relative to the photosensitive recording medium (3) in a sub scan direction* (i.e., noted the scanning direction as shown in Figs. 1-4) perpendicular to the main scan direction (i.e., see Fig. 2) after each line of the image is recorded on the photosensitive recording medium (3) so that a light emission condition of an exposing head may be carried out more efficiently (i.e., see col. 3, lines 30).

In view of the above, having the system of Pham '960 and then given the well-established teaching of Nakatani '514, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Pham '960 as taught by Nakatani '514,

since Nakatani '514 states at col. 3, lines 29+ that such a modification would allow the printer to perform a light emission condition of an exposing head more efficiently.

Regarding claim 8, Pham '960 discloses wherein luminance of the light emitting element (i.e., the LED elements 20a-20n) is variable depending upon drive voltage applied thereto (i.e., noted form Fig. 2 of Pham '960 that the light emitting of the LED is variable upon drive voltage applied thereto by adjusting the resistor; see col. 4, lines 40+), and the control device (31) controls the drive voltage (i.e., see col. 4, lines 25+) according the predetermined characteristic curve (i.e., noted from Figs. 4-9 of Pham '960 that the drive voltage must be adjusted as the driving time for the exposure time changes) as the driving time for each pixel elapses (i.e., see Figs. 4-9; col. 4, lines 25+, col. 7, lines 20+ and col. 8, lines 1+).

Further, it is noted that Pham '960 does not explicitly state wherein the printing head is a fluorescent display panel that contains an array of the light emitting elements.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Nakatani '514. In particular, Nakatani '514 teaches that it is conventionally well known in the art to use the printing head (60) which is a fluorescent display panel that contains an array of the light emitting elements (Fig. 1, 3 and 6; col. 4, lines 55+) so that the light emission condition of each luminous element may be readily grasped with accuracy by controlling the drive voltage applied thereto by the control device (i.e., see Fig. 10; col. 3, lines 10+, col. 5, lines 20+ and col. 10, lines 40+).

In view of the above, having the system of Pham '960 and then given the well-established teaching of Nakatani '514, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Pham '960 as taught by Nakatani '514

so that the light emission condition of each luminous element may be readily grasped with accuracy as suggested by Nakatani '514 (i.e., see col. 3, lines 10+).

Regarding claim 11, Pham '960 discloses (in Fig. 9) wherein the luminance (brightness) of the light emitting elements (LEDs) is varied (i.e., noted from Fig. 9, that the brightness level of the LEDs is varied by using the brightest of the LEDs "B" for recording a gray level No. 1 dot and using the weakest of the LEDs "W" for recording a gray level No. 15) during an exposure time (i.e., noted the "EXPOSURE TIME" of 6-100 microsecond) for recording the pixels (i.e., see col. 8, lines 10-45).

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pham '960 in view of Nakatani (U.S. 6,373,514) as discussed above and further in view of Masubuchi et al. (U.S. 6,262,757).

Regarding claim 9, although the combination of Pham '960 and Nakatani '514 show the control device (i.e., Fig. 2, the element 31; and Fig. 10, the element 7) raises the drive voltage as the driving time for each pixel elapses (i.e., see Figs. 4-9 and col. 4, lines 35+, col. 8, lines 1+ of Pham '960; and col. 5, lines 20+, col. 10, lines 40+ of Nakatani '514), the combination of Pham '960 and Nakatani '514 does not explicitly stated wherein the photosensitive recording medium is a self-developing type photo film unit.

However, the above-mentioned claimed limitations are well known in the art as evidenced by Masubuchi '757. In particular, Masubuchi '757 teaches that it is conventionally well known to use a self-developing type photo film unit (i.e., col. 1, lines 25+) which producing

photographs shortly after the photosensitive medium has been exposed so that the delay between image acquisition and viewing the print is reasonably shot.

In view of the above, having the system of Pham '960 and then given the well-established teaching of Masubuchi '757, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Pham '960 as taught by Masubuchi '757, and such a modification would obviously allow for immediate preview of an acquired image thereof.

Allowable Subject Matter

7. Claims 12-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Murayama '700 shows the use of LEDs for exposing a photosensitive medium, and further shows the brightness (luminance) variations of the LEDs, the amount of exposure deviates form an ideal exposure amount-gradation level curve as shown in Fig. 8.

b. Hammond '658 shows wherein the luminance of the LEDs is controlled by changing a driving voltage at different levels (i.e., see Fig. 3).

c. Fujita '355 show the use of LEDs for performing the exposure by varying the voltage impressed on the LEDs (i.e., see col. 9, lines 30+).

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aung S. Moe whose telephone number is 703-306-3021. The examiner can normally be reached on Mon-Fri (9-5).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on 703-305-4929 (or 571-272-7308). The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Aung S. Moe
Primary Examiner
Art Unit 2612

A. Moe
February 3, 2005